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Best Demonstrated Available Technology (BDAT) Background Document for K009 and K010 (Proposed)

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This background document provides the Agency's technical support for selecting and developing treatment standards for the constituents to be regulated for the K009 and K010 wastes. Section 2 presents waste-specific information, the number and location of facilities affected by the land disposal restrictions, the waste generating process, and waste characterization data. Section 3 discusses the applicable and demonstrated technologies used to treat the waste or similar wastes, and Section 4 summarizes the available performance data, including data on which the treatment standards are based. Section 5 explains EPA's determination of BDAT, which Section 6 discusses the seletion of constituents proproposed for regulation. Determination of treatment standars is presented in Section 7.

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PROPOSED

BEST DEMONSTRATED AVAILABLE TECHNOLOGY (BDAT)

BACKGROUND DOCUMENT FOR

K009 AND K010

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1. INTRODUCTION

Pursuant to section 3004(m), enacted by the Hazardous and Solid Waste Amendments (HSWA) on November 8, 1984, the Environmental Protection Agency (EPA) is establishing best demonstrated available technology (BDAT) treatment standards for wastes from acetaldehyde production. These wastes are identified in 40 CFR Part 261.32 as K009 and K010. Compliance with these BDAT treatment standards is a prerequisite for the placement of these wastes in facilities designated as land disposal units according to 40 CFR Part 268. The effective date of these treatment standards is June 8, 1989.

This background document provides the Agency's technical support for selecting and developing treatment standards for the constituents to be regulated for the K009 and K010 wastes. Section 2 presents waste-specific information, the number and location of facilities affected by the land disposal restrictions, the waste generating process, and waste characterization data. Section 3 discusses the applicable and demonstrated technologies used to treat the waste (or similar wastes), and Section 4 summarizes the available performance data, including data on which the treatment standards are based. Section 5 explains EPA's determination of BDAT, while Section 6 discusses the selection of constituents proposed for regulation. Determination of treatment standards is presented in Section 7.

The BDAT program and promulgated methodology are more thoroughly described in two additional documents: Methodology for Developing BDAT

Treatment Standards (USEPA 1988c) and Generic Quality Assurance Project Plan for Land Disposal Restrictions Program ("BDAT") (USEPA 1987c). The petition process to be followed in requesting a variance from the BDAT treatment standards is discussed in the methodology document.

EPA has identified two companies that produce acetaldehyde. The Agency is proposing the regulation of three organic constituents in K009 and K010 nonwastewaters and five organic constituents in K009 and K010 wastewaters. For the purpose of determining the applicability of the treatment standards, wastewaters are defined as wastes containing less than 1 percent (weight basis) total suspended solids* (TSS) and less than 1 percent (weight basis) total organic carbon (TOC). Waste not meeting this definition must comply with the treatment standards for nonwastewaters.

The proposed performance standards for the organic constituents in K009 and K010 nonwastewaters have been established based on a transfer of performance data and the treatment standards established for K019 wastes, and are based on total concentration analysis of the ash residuals generated during incineration of K019 waste.

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*The term "total suspended solids" (TSS) clarifies EPA's previously used terminology of "total solids" and "filterable solids." Specifically, total suspended solids is measured by Method 209C, Total Suspended Solids Dried at 103 to 105°C, in Standard Methods for the Examination of Water and Wastewaters, 16th Edition (APHA, AWWA, and WPCF 1985).

The BDAT level of performance standards for K009 and K010 wastewaters are being proposed based on a transfer of treatment performance data from EPA's Office of Water for wastewaters that are believed to be similar to and/or contain constituents present in K009 and K010 wastewaters. These data were used to establish the Effluent Limitations Guidelines and Standards for the Organic Chemicals, Plastics, and Synthetic Fibers Industries (USEPA 1987a, 1987b).

If the concentrations of the regulated constituent, as generated, are lower than or equal to the proposed BDAT treatment standards (presented in Table 1-1), then the wastes are not prohibited from being placed in land disposal units.

Table 1-1 BDAT Treatment Standards for K009 and K010

Nonwastewaters

Constituent	Maximum for any single grab sample: Total composition (mg/kg)	Maximum for any single grab sample: TCLP (mg/l)
Chloroform	6.0	Not Applicable
1,1-Dichloroethane	6.0	Not Applicable
Methylene chloride	30.0	Not Applicable

Wastewaters

Constituent	Maximum for any single grab sample: Total composition (mg/l)	Maximum for any single grab sample: TCLP (mg/l)
Acrolein	0.14	Not Applicable
Chloroform	0.09	Not Applicable
1,1-Dichloroethane	5.3	Not Applicable
Ethyl methacrylate	0.18	Not Applicable
Methylene chloride	0.03	Not Applicable

2. INDUSTRY AFFECTED AND WASTE CHARACTERIZATION

This section describes the industry affected by the land disposal restrictions for K009 and K010 and presents available characterization data for these wastes.

Under 40 CFR Part 261.32, wastes defined as K009 and K010 are generated in the production of acetaldehyde and are listed as follows:

K009: Distillation bottoms from the production of acetaldehyde from ethylene.

K010: Distillation side cuts from the production of acetaldehyde from ethylene.

The Agency has determined that the listed wastes K009 and K010 represent two separate waste treatability groups based on their different physical and chemical characteristics. Although these wastes are generated by similar processes, EPA has data showing that K009 wastes typically contain less than 1 percent TOC and less than 1 percent TSS and, as originally generated, are thus classified as wastewaters for the purpose of establishing BDAT. Conversely, the Agency has data showing that K010 wastes are typically over 1 percent TOC and therefore, as originally generated, are classified as nonwastewaters. Residuals generated from the treatment of either K009 or K010 could be classified as wastewaters or nonwastewaters depending on their characteristics (TOC and TSS). As described later in this section, EPA examined the available waste characterization data for the manufacturing process generating these listed wastes, as well as the applicable and demonstrated treatment technologies for these wastes.

2.1 Industry Affected and Process Description

The four-digit Standard Industrial Classification (SIC) code associated with the production of industrial organic chemicals, including acetaldehyde, is 2869. A flow diagram of the production process is presented in Figure 2-1. The Agency estimates that only two companies produce acetaldehyde and may generate K009 and K010 wastes: (1) Texas Eastman Company (two plants located in Longview, Texas) and (2) Celanese Company (one plant located in Bay City, Texas).

2.1.1 Acetaldehyde Production

Commercial processes for the production of acetaldehyde include (1) the oxidation or dehydrogenation of ethanol, (2) the addition of water to acetylene, (3) the partial oxidation of hydrocarbons, and (4) the direct oxidation of ethylene.

The direct liquid-phase oxidation of ethylene is the most widely used method for the manufacture of acetaldehyde.* Ethylene is catalytically oxidized with air in a dilute hydrochloric acid solution containing the chlorides of palladium and copper in a tubular reactor. The reaction products are flash evaporated, and the product acetaldehyde passes overhead to the crude distillation column. The aqueous bottoms go to a regeneration reactor, where the palladium catalyst is regenerated and recycled to the acetaldehyde reactor. The product from the crude distillation column is condensed and scrubbed; unreacted ethylene and

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*Three facilities produce acetaldehyde from ethylene. Two facilities report using 100 percent pure ethylene, and the other uses a mixture of 90 percent ethylene and 10 percent ethyl alcohol.

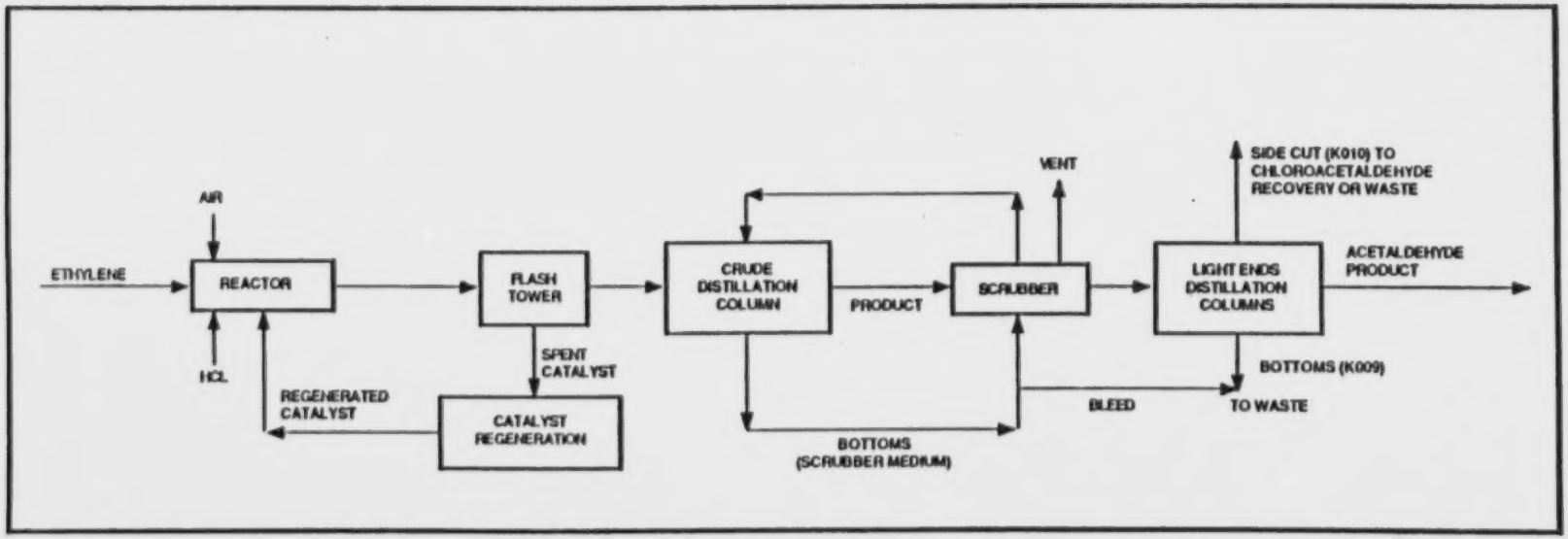

FIGURE 2-1 GENERATION OF K009 AND K010 WASTES FROM ACETALDEHYDE PRODUCTION (LIQUID-PHASE OXIDATION OF ETHYLENE)

light hydrocarbons (including a small amount of acetaldehyde) are vented. The crude acetaldehyde from the scrubber then goes to final distillation. The reaction chemistry is explained below.

The process involves the oxidation of ethylene by palladium chloride to form the product acetaldehyde, palladium metal, and hydrogen chloride:

$$C_2H_4 + PdCl_2 + H_2O \rightarrow CH_3CHO + Pd + 2HCl$$

ethylene	palladium chloride		acetaldehyde	metallic palladium	hydrochloric acid

Cupric chloride is used as the second component of the catalyst system to reoxidize the palladium metal to palladium chloride:

$$2CuCl_2 + Pd \rightarrow PdCl_2 + 2CuCl$$

cupric chloride	palladium chloride	cuprous chloride

The cuprous chloride thus formed is, in turn, reoxidized to cupric chloride in the second-stage regeneration unit:

$$4CuCl + O_2 + 4HCl \rightarrow 4CuCl_2 + 2H_2O$$

cuprous chloride	cupric chloride

Two hazardous waste streams are generated from the production of acetaldehyde. Distillation bottoms (K009) contain treatable concentrations of BDAT list organics such as acrolein, acrylonitrile, benzene, chloroform, 1,1-dichloroethane, 2,4-dinitrophenol, ethyl acetate, ethyl methacrylate, methylene chloride, and toluene. Distillation side cuts (K010) contain slightly higher concentrations of BDAT list organics similar to the aforementioned constituents in K009 wastes.

2.2 Waste Characterization

This section presents waste characterization data currently available to the Agency for K009 and K010 wastes. The approximate concentrations of major waste constituents are included in Table 2-1. These data were obtained from a variety of sources including literature and estimates using available chemical analysis. Tables 2-2 and 2-3 present the BDAT list constituents and non-BDAT list constituents in K009 and K010 wastes. According to available characterization data for K009 and K010 wastes, K009 waste contains 96.8 to 96.9 percent water, 3.1 to 3.16 percent total BDAT list and Non-BDAT list organics, and 0.27 to 0.63 percent total organic carbon (TOC). EPA has data showing that K010 waste contains 46.7 to 51.2 percent water, 48.8 to 53.8 percent total BDAT list and Non-BDAT list organics, and 3.6 to 3.8 percent TOC. Also, data indicate that the heat content of K010 waste is less than 1,660 British thermal units per pound (Btu/lb).

2.3 Non-BDAT List Appendix VIII Constituents

Non-BDAT list Appendix VIII (40 CFR Part 261) organic constituents that are expected to be present in K009 and K010 waste at treatable concentrations include acetic acid, acetyl chloride, chloral, chloroacetaldehyde, crotonaldehyde, formaldehyde, formic acid, and paraldehyde.

Since there are currently no EPA-approved methods that can adequately analyze these constituents at low concentration levels, the constituents have not yet been placed on the BDAT list. The Agency is also

considering the following as surrogates or indicators for these non-BDAT list Appendix VIII constituents: biological oxygen demand (BOD), chemical oxygen demand (COD), total organic content, total volatile solids, and total organic chlorine content.

The Agency does not expect these non-BDAT list Appendix VIII constituents to interfere with or behave differently from the BDAT list constituents identified as candidates for regulation in K009 and K010 wastewaters. This is because these non-BDAT list constituents are generated from the same production process as the BDAT list constituents and have physical and chemical characteristics similar to those of the BDAT list constituents. However, the Agency is soliciting information that would either reaffirm this belief or determine that these constituents behave differently or interfere with the treatment of BDAT list organic constituents. If the latter data become available, the Agency may decide to (1) defer regulation of these non-BDAT list Appendix VIII constituents to a later date or (2) set additional requirements for K009/K010 wastes prior to disposal, according to the methodology explained below.

If the reliability and validity of analytical methods for non-BDAT list Appendix VIII constituents cannot be determined prior to promulgation in May 1990, the Agency would be unable to develop numerical treatment standards for these non-BDAT list constituents. Similarly, if the Agency is unable to identify a surrogate parameter or indicator constituent that would evidence the destruction or removal of these non-BDAT list Appendix VIII organic constituents, the Agency would be

unable to set a surrogate parameter or indicator constituent that would indicate that treatment of these organic BDAT list constituents has been accomplished.

2.4 Constituents Present in K009 and K010 Waste Believed to be Extraneous to the Manufacture of Acetaldehyde

The Agency's data characterizing the process waste streams from the production of acetaldehyde via oxidation of ethylene show several constituents that the Agency believes may be extraneous to the manufacturing process of acetaldehyde that potentially generates K009 and K010 wastes. Examples of these constituents are acrolein, acrylonitrile, benzene, 2,4-dinitrophenol, and toluene.

The determination of whether the above-mentioned constituents are extraneous to the acetaldehyde manufacturing process is based on a review of (1) all available data for the untreated K009 and K010 waste and (2) technical literature pertaining to the acetaldehyde manufacturing process.

The Agency concluded that all of the aforementioned substances, with the exception of acrolein, could be eliminated as potential constituents generated by the manufacturing process of acetaldehyde. The Agency's rationale for this determination is presented below.

Substances such as benzene and phenol were not expected to be present in K009 and K010 wastes because their vapor pressures are negligible at the temperature at which commercial ethylene (feedstock for production of acetaldehyde) production is purified (-101°C). In addition nitrated

phenols are not expected to be present. Air normally contains approximately 78 percent nitrogen. However, a review of all available process literature reveals that molecular nitrogen plays no role in the process. There are no other sources of nitrogen atoms available in the process feedstock.

Aromatic waste products have never been reported and are very unlikely to occur because of the vast differences in vapor pressures between ethylene and simple aromatic compounds such as benzene and toluene. Thus, any benzene, toluene, or nitrated or halogenated phenols found must originate from sources other than the process. Acrylonitrile likewise can be dismissed as a process-related waste because no amines, cyanides, or other possible sources of a nitrile group are present in the feedstocks used. Acrolein cannot be eliminated as an extraneous constituent because it could theoretically result from propylene contamination of the ethylene feedstock.

2.5 Determination of Waste Treatability Group

Fundamental to waste treatment is the concept that the type of treatment technology used and the level of treatment achieved depend on the physical and chemical characteristics of the waste.

Based on review of the generation of K009 and K010 wastes and all available data characterizing these wastes, the Agency has determined that these wastes represent two separate treatability groups. Characterization data show that K009 wastes typically contain less than 1 percent total organic carbon (TOC) and less than 1 percent total

suspended solids (TSS) and therefore, as originally generated, are classified as wastewaters for the purpose of establishing BDAT. In contrast, EPA has data showing that K010 wastes are typically over 1 percent TOC and therefore, as originally generated, are classified as nonwastewaters.

Table 2-1 Major Constituent Composition for K009 and K010 Wastes

Constituent	Concentration (wt percent) K009 waste	K010 waste
Water[a]	96.8-96.9	46.7-51.2
Total BDAT list and Non-BDAT list organics[a]	3.1-3.16	48.8-53.3
Total organic content[b]	0.27-0.63	3.6-3.8

References:

a Data from characterization of waste streams (for K009/K010) listed in 40 CFR Part 261 Waste Profiles by Environ Corporation (USEPA 1985).

b Texas Eastman Company waste characterization data submitted to EPA-OSW on November 10, 1988.

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Table 2-2 Constituent Analysis in K009 Waste

BDAT ref no	Constituent	Waste characterization (mg/kg) for untreated K009 wastes (a)	(b)	(c)	(d)
	BDAT list constituents:				
2	Acrolein	-	ND	CBI	CBI
3	Acrylonitrile	-	ND	CBI	CBI
4	Benzene	-	ND	CBI	CBI
14	Chloroform	*	1.4-2.6	CBI	CBI
22	1,1-dichloroethane	-	ND	CBI	CBI
101	2,4-dinitrophenol	-	ND	CBI	CBI
225	Ethyl acetate	-	2.2	CBI	CBI
31	Ethyl methacrylate	-	2.0	CBI	CBI
35	Methyl chloride	*	ND	CBI	CBI
36	Methylene chloride	*	ND	CBI	CBI
43	Toluene	-	ND	CBI	CBI
	BDAT list metals:				
159	Chromium (total)	-	<0.05	CBI	CBI
161	Lead	-	<0.05	CBI	CBI
162	Mercury	-	.0004-< 0007	CBI	CBI
	Non-BDAT list organics:				
	Acetic acid	13,900	-	CBI	CBI
	Acetyl chloride	4,200	-	CBI	CBI
	Chloral	2,100	150-1,900	CBI	CBI
	Chloroacetaldehyde	-	15.0-92.0	CBI	CBI
	Crotonaldehyde	-	<10.0-60.0	CBI	CBI
	Dichloroacetaldehyde	-	500-3,100	CBI	CBI
	Formaldehyde	*	<10.0	CBI	CBI
	Formic acid	-	-	CBI	CBI
	Paraldehyde	1,600	<10.0	CBI	CBI
	Non-BDAT list metal:				
	Copper	-	.51-.65	CBI	CBI

- = No data provided.
ND = Not detected.
* = The combined value of methylene chloride, methyl chloride, chloroform, and formaldehyde is 2,000 mg/kg in the untreated waste.
CBI = Confidential Business Information.

References.

a. Data from characterization of waste streams listed in 40 CFR Part 261 waste profiles (K009/K010) by Environ Corporation prepared for EPA in 1985.

b. Texas Eastman Company waste characterization data submitted to EPA-OSW on November 10, 1988.

c. Texas Eastman Company data presenting hydrolysis as BDAT submitted to EPA on May 31, 1988. These data are claimed as Confidential Business Information. This information is available in the confidential portion of the Administrative Record for this rulemaking.

d. K009 and K010 waste characterization data from EPA Office of Water's Organic Chemicals, Plastics, Synthetic Fibers (OCPSF) data base is claimed as Confidential Business Information. This information is available in the confidential portion of the Administrative Record for this rulemaking.

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Table 2-3 Constituent Analysis in K010 Waste

BDAT ref. no.	Constituent	Waste characterization (mg/kg) for untreated K010 waste (a)	(b)	(c)	(d)
	BDAT list constituents:				
2	Acrolein	-	ND	CBI	CBI
3	Acrylonitrile	-	ND	CBI	CBI
4	Benzene	-	ND	CBI	CBI
14	Chloroform	*	120-3800	CBI	CBI
22	1,1-dichloroethane	-	ND	CBI	CBI
101	2,4-dinitrophenol	-	ND	CBI	CBI
225	Ethyl acetate	-	ND	CBI	CBI
31	Ethyl methacrylate	-	ND	CBI	CBI
15	Methyl chloride	*	ND	CBI	CBI
38	Methylene chloride	*	520-730	CBI	CBI
43	Toluene	-	ND	CBI	CBI
	BDAT list metals:				
159	Chromium (total)	-	<0.02-.2	CBI	CBI
161	Lead	-	<0.05	CBI	CBI
162	Mercury	-	<.0002-.0004	CBI	CBI
	Non-BDAT list organics:				
	Acetaldehyde	7,800	-	CBI	CBI
	Acetic acid	600	-	CBI	CBI
	Acetyl chloride	5,000	-	CBI	CBI
	Chloral	3,400	0.83-4.2	CBI	CBI
	Chloroacetaldehyde	5,500	4.5-8.5	CBI	CBI
	Crotonaldehyde	-	<0.05-0.80	CBI	CBI
	Dichloroacetaldehyde	-	2.3-8.6	CBI	CBI
	Formaldehyde	*	<10.0	CBI	CBI
	Formic acid	-	-	CBI	CBI
	Paraldehyde	-	<0.05-0.11	CBI	CBI
	Non-BDAT list metal:				
	Copper	-	<0.05-0.2	CBI	CBI

- = No data provided.
ND = Not detected.
* = The combined value of chloroform, methylene chloride, methyl chloride, and formaldehyde is 4,000 mg/kg in the untreated waste.
CBI = Confidential Business Information

References:

a. Data from characterization of waste streams listed in 40 CFR Part 261 waste profiles (K009/K010) by Environ Corporation prepared for EPA in 1985.

b. Texas Eastman Company waste characterization data submitted to EPA-OSW on November 10, 1988.

c. Texas Eastman Company data presenting hydrolysis as BDAT submitted to EPA on May 31, 1988. These data are claimed as Confidential Business Information. This information is available in the confidential portion of the Administrative Record for this rulemaking.

d. K009 and K010 waste characterization data from EPA Office of Water's OCPSF data base is claimed as Confidential Business Information. This information is available in the confidential portion of the Administrative Record for this rulemaking.

3. APPLICABLE AND DEMONSTRATED TREATMENT TECHNOLOGIES

Section 2 established two treatability groups for the management of K009 and K010 wastes. This section identifies the treatment technologies that are applicable to these groups and determines which, if any, of the applicable technologies can be considered demonstrated for the purpose of establishing BDAT.

To be applicable, a technology must be demonstrated to treat the waste in question or to treat a waste that is similar in terms of the parameters that affect treatment selection. To be demonstrated, the technology must be employed in full-scale operation for the treatment of the waste in question or a similar waste. Technologies available only at pilot- and bench-scale operations are not considered in identifying demonstrated technologies.

3.1 Applicable Treatment Technologies

Initial data gathering on the treatment of K009 and K010 wastes included review of the following: (1) the National Survey of Treatment, Storage, Disposal, and Recycling Facilities data base for K009 and K010 (USEPA 1986); (2) CBI data from Texas Eastman Company submitted to the Agency, presenting hydrolysis treatment data for K009 and K010 wastes; (3) data from characterization of Waste Streams Listed in 40 CFR Part 261 Waste Profiles (K009/K010) prepared for EPA in 1985 (USEPA 1985); (4) technical literature sources; and (5) review of the Office of Water's Development Document for Effluent Limitations Guidelines and Standards for the Organic Chemicals, Plastics and Synthetic Fibers Point Source Category.

Since K009 and K010 wastes contain organics, as shown in Section 2.3, the Agency believes that the technologies applicable to the untreated listed wastes should include those that destroy or reduce the total amount of the organic compounds in the wastes. Additionally, treatment of residuals (wastewaters and nonwastewaters) generated from the treatment of BDAT list organics should also be considered.

For K009 and K010 wastewaters, the Agency has identified the following potentially applicable treatment technologies: (1) hydrolysis followed by biological treatment, followed by incineration of biomass; (2) hydrolysis followed by either carbon adsorption or steam stripping; (3) biological treatment in combination with steam stripping and/or carbon adsorption, followed by incineration of biomass and spent carbon; (4) steam stripping followed by carbon adsorption; and (5) wet air oxidation followed by biological treatment, followed by incineration. (Detailed information on the above-mentioned technologies may be found in the BDAT Treatment Technology Background Document.)

EPA has not identified facilities that specifically use steam stripping followed by carbon adsorption, wet air oxidation followed by biological treatment, or hydrolysis followed by carbon adsorption or steam stripping on K009 and K010 wastes. However, based on waste parameters that affect treatment selection for these technologies, the Agency feels that K009 and K010 would be no more difficult to treat than any wastes for which these technologies are applicable.

For the K009 and K010 nonwastewaters, either as generated or as residuals from treatment of K009 and K010 wastes, the Agency has identified the following technologies as potentially applicable: (1) incineration, (2) fuel substitution, (3) solvent extraction followed by recovery or incineration of the contaminated solvent, and (4) recycle or reuse.

3.1.1 Nonwastewaters

Incineration is a destruction technology in which energy, in the form of heat, is transferred to the waste in order to volatilize hazardous constituents and to destabilize chemical bonds, eventually destroying the hazardous constituents by converting them to carbon dioxide, water, and/or other oxidized waste constituents. In general, two residuals are generated by incineration processes: ash and scrubber water. The incineration of K009 and K010 nonwastewaters will result in scrubber waters that can be designated as wastewater derived from the treatment of K009 and K010 nonwastewaters. The scrubber water is expected to contain only very low levels of organic constituents, since most of the organics are expected to be destroyed in the incinerator.

Fuel substitution, like incineration, destroys the organic constituents of a waste, but it also derives a fuel value from the waste. The fuel substitution of nonwastewaters is expected to generate combustion gas scrubber water, which would be designated as wastewater derived from the treatment of nonwastewaters.

Solvent extraction of hazardous wastes is a process whereby a contaminant dissolved in a liquid is transferred from the waste to an extracting solvent that preferentially dissolves that substance. For solvent extraction to be effective, the extracting solvent must be immiscible in the waste to be treated and must differ in density so that phase separation is possible.

Recycling is the use, reuse, or reclaiming of a material (40 CFR Part 261.1). A material is "used or reused" if it is either employed as an ingredient (including its use as an intermediate) to make a product or employed in a particular function as an effective substitute for a commercial product. A material is "reclaimed" if it is processed to recover a useful product or if it is regenerated.

3.1.2 Wastewaters

Hydrolysis is a technology that causes decomposition of a chemical compound. Typically, during hydrolysis a chemical reaction occurs in which water reacts with another substance to form two or more new substances. Elevated temperatures and/or pressures usually enhance rates of hydrolysis. Hydrolysis will replace one or more of the substitute halogens with hydroxyl groups. The resulting compound is generally more oxidizable or biodegradable. (This hydrolysis discussion was derived from a paper titled Hydrolysis prepared by Lawrence N. Davidson of Arthur D. Little, Inc. This paper is available in the Administrative Record for this background document.)

Carbon adsorption is a separation technology used to remove and/or recover dissolved organics and certain inorganics from aqueous streams. Powdered or granular activated carbon particles are used as the adsorbing medium in this technology.

Steam stripping is a technology that can separate more volatile materials from less volatile materials by vaporizing the more volatile materials and then condensing them. As such, it is a type of distillation process.

Biological treatment is a technology that uses living microorganisms to decompose organic constituents. Biological treatment can occur either in the presence of oxygen, known as aerobic treatment, or in the absence of oxygen, referred to as anaerobic treatment. The organic constituents are broken down into water, carbon dioxide, and other organic components by the microorganisms.

Wet air oxidation converts hazardous waste to less toxic substances by the aqueous phase oxidation of dissolved or suspended organic or inorganic substances at elevated temperature and pressure. Elevated pressure is used to keep the water in its liquid state, allowing organic destruction to proceed at lower temperatures than would otherwise be necessary. Water serves to moderate the oxidation rate, removing excess heat of reaction. Oxygen is incorporated as the oxidizing agent. It is important to point out that sometimes wet air oxidation will not achieve complete oxidation of the organic constituents, and additional treatment of wastewater effluent by aerobic biological treatment may be necessary.

3.2 Demonstrated Treatment Technologies

3.2.1 Nonwastewaters

Of the aforementioned applicable technologies for BDAT list organic constituents, the Agency believes that incineration is demonstrated to treat K009 and K010 nonwastewaters (either as generated or as treatment residuals).

The Agency has not identified any facilities that incinerate K009 and K010 nonwastewaters. However, EPA has data from incineration of K019 wastes (chlorinated organics) that have chlorinated organic hazardous constituents similar to those present in K009 and K010 nonwastewaters. The Agency believes that K019 is more difficult to treat than K009 and K010 nonwastewaters because K019 contains organic constituents that have higher bond dissociation energies and higher boiling points than any of the organic constituents present in K009 and K010 nonwastewaters (see Appendix B).

The Agency has determined that recycling is demonstrated for K010 wastes because one facility submitted CBI data showing treatment of K010 waste through recycling. However, the Agency's data show that the residuals of these recycling practices result in wastewaters that need further treatment prior to disposal. Consequently, this recycling practice is not considered total recycling. These residuals are thus treated by a proprietary hydrolysis process followed by biological treatment. In fact, the facility recycling K010 reported co-disposing of both K010 and K009 wastewaters.

3.2.2 Wastewaters

One facility is currently using hydrolysis followed by biological treatment to treat K009 and K010 wastewaters. As a result, the Agency has determined that hydrolysis followed by biological treatment is a demonstrated technology for K009 and K010 wastewaters.

EPA's Office of Water has performance data showing that biological treatment, steam stripping, carbon adsorption, or any combination of these technologies is being used to treat wastewaters believed to be similar to, or containing constituents also present in, K009 and K010 wastewaters.

The Agency has no data to suggest that any of the other applicable technologies are demonstrated for K009 and K010 wastewaters or similar wastes.

4. PERFORMANCE DATA BASE

This section presents the data available on the performance of demonstrated technologies in treating the listed wastes. These data are used elsewhere in this document for determining which technologies represent BDAT (Section 5), for selecting constituents to be regulated (Section 6), and for developing treatment standards (Section 7). In addition to full-scale demonstration data, eligible data may include data developed at research facilities or obtained through other applications at less than full-scale operation, as long as the technology is demonstrated in full-scale operation for a similar waste as defined in Section 3.

Performance data, to the extent that they are available to EPA, include the untreated and treated waste concentrations for a given constituent, the values of operating parameters that were measured at the time the waste was being treated, the values of relevant design parameters for the treatment technology, and data on waste characteristics that affect performance of the treatment technology.

Where data are not available on the treatment of the specific wastes of concern, the Agency may elect to transfer data on the treatment of a similar waste or wastes, using the demonstrated technology. To transfer data from another waste category, EPA must find that the untested wastes (those covered by this background document) are no more difficult to treat (based on the waste characteristics or the parameters that affect performance of the demonstrated treatment technology) than the treated wastes from which performance data are being transferred.

4.1 Nonwastewaters

4.1.1 BDAT List Organics

The Agency does not have performance data available to characterize treatment of K009 and K010 nonwastewaters; however, it does have data for incineration of a similar waste, K019. According to 40 CFR Part 261.32, K019 is listed as "heavy ends from the distillation of ethylene dichloride in ethylene dichloride production." This similarity is based on the waste compositions and the waste characteristics affecting performance and, in addition, K009 and K010 wastes are also produced from distillation column residuals. (See Appendix B for a summary of the waste characteristics affecting performance for constituents of concern in K009 and K010 wastes.)

Consequently, the Agency is transferring performance data from the treatment of K019 to K009 and K010 nonwastewaters. (Nonwastewaters may be K009 and K010 as generated or the residuals from treatment of K009 and K010 wastes, e.g., spent activated carbon from wastewater treatment or biomass from biological treatment.) Performance data for the treatment of the organic constituents present in K009 and K010 nonwastewaters are being transferred from Tables 3-1 through 3-11 of the Best Demonstrated Available Technology (BDAT) Background Document for Chlorinated Organics Treatability Group (K016, K018, K019, K020, K030) (USEPA 1988a). These tables present the six data sets of the BDAT list constituents detected in the untreated (K019 and RCRA blend, a combination of oily, solvent water and other industrial organic waste residuals not necessarily a Resource Conservation and Recovery Act hazardous waste), and treated

(rotary kiln ash) wastes from the rotary kiln incineration treatment system (including afterburner performance data). These tables also present design and operating data for each sample set. The testing procedures used to analyze these constituents are specifically identified in the analytical quality assurance/quality control discussion of the BDAT Background Document for Chlorinated Organics Treatability Group (K016, K018, K019, K020, K030).

As mentioned in Section 3, the Agency has determined that recycling is demonstrated for K010 nonwastewaters because one facility currently treats K010 nonwastewater by recycling.

4.1.2 BDAT List and Non-BDAT List Metals

The levels of chromium (total), mercury, and lead in K009 and K010 wastes were determined to be below treatable levels. As a result, the Agency is not proposing to regulate these BDAT list metals. The Agency, however, found copper at treatable concentrations in K009 and K010 wastes. Because copper is not listed in Appendix VIII of 40 CFR Part 261 as an elemental constituent but rather as a specific compound (i.e., copper cyanide), the Agency does not intend to regulate copper in K009 and K010 wastes.

4.2 Wastewaters

The Agency has CBI performance data on hydrolysis only, from a facility using hydrolysis followed by biological treatment of K009 and K010 wastewaters. The Agency was not given biological treatment data to determine the performance of biological treatment. EPA also has

performance data from the Office of Water's (OW's) data base supporting the development of Effluent Limitations Guidelines for the Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) Industries.

The Office of Solid Waste reviewed 13 sets of performance data from the OW's OCPSF data base for the Best Available Technology (BAT Option II Toxics (Subcategory One - plants that have or will install biological treatment to comply with the Best Practicable Control Technology currently available (BPT)) for end-of-pipe biological treatment plus in-plant control technologies that treat the constituents prior to discharge to end-of-pipe treatment. The wastewater treatment technologies for which these data were collected include biological treatment and/or steam stripping (see Table 4-1 for the wastewater treatment technologies utilized at those plants in the OCPSF data base from which performance data were selected).

These data do not all represent treatment of K009 and K010 wastewaters, but rather treatment of wastewaters that contain constituents that are also present in K009 and K010 wastewaters. The Agency may use data from wastes believed to be similar or data from wastes that contain constituents, or similar constituents, present in a waste of concern.

The transfer of treatment data is supported by the determination that K009 and K010 wastes generated by the Organic Chemical, Plastics, and Synthetic Fibers Industry are applicable to the Chemical Organic Commodity Industry, and because the constituents present in the wastes treated by the Office of Water are similar to those in K009 and K010

wastes. Also, the Agency concluded that none of the constituents present in K009 and K010 wastes are likely to interfere with or reduce the level of performance achieved by the wastes tested by OW.

Therefore, the Agency is transferring performance data from the OW's, OCPSF BAT Option II Toxics (Subcategory One) limitations data base for constituents present in K009 and K010 wastewaters. Table 4-1 presents the average influent and effluent concentrations, as well as the wastewater treatment technologies from the OCPSF BAT Option II Toxics (Subcategory One) data base, for those plants treating constituents (or surrogate constituents) present in K009 and K010 wastewaters (i.e., acrolein, chloroform, 1,1-dichloroethane, ethyl methacrylate, and methylene chloride). The performance data used to establish the wastewater treatment standards is believed to be accuracy corrected. If information to the contrary becomes available, the Agency may amend the treatment standards in the final rule. Performance data for all the data sets used for determining the proposed BDAT treatment standards are presented in Appendix B of this Background Document. The data editing procedures used in selecting the data for calculation of the proposed BDAT treatment standards for wastewaters are discussed below.

The Agency evaluated the performance data from the OW's OCPSF BAT Option II Toxics (Subcategory One) Limitations data base to determine whether the data were corrected for analytical accuracy. Data sets from the 12-plant (T) category and the verification (V) plant category are believed to include analytical, accuracy-corrected data. Data sets from the 5-plant (F) category are also assumed to be accuracy corrected. Data

sets from plants denoted public comment (P) were deleted because the Agency was not certain that proper accuracy correction has been performed for these data. If information becomes available to the Agency that shows that proper accuracy correction was not performed for any of the data used for developing the proposed treatment standards, the Agency may revise the treatment standards in the final rule. Data sets were deleted if the influent concentrations of the OW data were less than the lowest concentration for the constituent's raw waste concentration in K009 and K010 wastes. Data points in OW's data base with effluent concentrations greater than the corresponding influent concentrations were deleted because the Agency believes they do not represent effective treatment. The Agency's rationale for consideration and/or deletion of data to be used for calculation of the proposed BDAT treatment standards for constituents in K009 and K010 wastewaters is presented below.

4.2.1 Acrylonitrile (surrogate for acrolein)

Performance data from the OW's OCPSF, BAT Option II Toxics (Subcategory One) Limitations data base are not available for acrolein. However, the Agency is transferring the performance data for acrylonitrile to acrolein based on the similarity of their chemical structures. The two compounds differ only in the two terminal groups present (aldehyde for acrolein and nitrile for acrylonitrile). Aldehydes are more easily oxidized than nitriles, and therefore the Agency concludes that it is valid to transfer the performance data from acrylonitrile to acrolein.

Five data sets were available from the OW's OCPSF, BAT Option II Toxics (Subcategory One) Limitations data base. Influent concentrations for acrylonitrile data from plants 883V, 948V, 1349V, and 2536T were below the lowest concentration level (870.0 ppm) for acrolein detected in the K009 and K010 raw waste. The only data set with influent concentrations equal to or above the K009/K010 raw waste concentration for acrolein was from plant 948F. The Agency therefore selected the data set from plant 948F to be used for calculation of the proposed BDAT treatment standard. Although the data set from plant 948F had only one data point for acrylonitrile with an influent concentration greater than the K009 or K010 raw waste concentration for acrolein, there were 52 other data points for treatment of acrylonitrile in the data from plant 948F. All but 3 of these 52 data points were treated to nondetectable levels (0.05 ppm detection level). The other three data points did not exceed 0.16 ppm. Therefore, the Agency used only the one aforementioned data point for calculation of the proposed BDAT treatment standard for acrylonitrile.

4.2.2 Chloroform

Eight data sets were available from the OW's OCPSF, BAT Option II Toxics (Subcategory One) Limitations data base. The data set from plant 2693P was deleted because it is not believed to be adjusted for analytical accuracy. Influent concentrations from plants 725T, 1609V, and 2631V were below the lowest concentration level (1.4 ppm) for chloroform detected in K009 and K010 raw waste. Only data sets from plant 725V and 2631F had influent concentrations equal to or above the

concentration for chloroform in K009 and K010 raw waste. The data set from plant 725V was deleted because it had only 3 data points as opposed to 12 data points from plant 2631F (with overall higher concentrations in their influents). The Agency therefore selected the data set from plant 2631F to be used for calculation of the proposed performance standard.

4.2.3 Diethyl phthalate (surrogate for ethyl methacrylate)

Performance data for ethyl methacrylate were not available from the OW's OCPSF, BAT Option II Toxics (Subcategory One) Limitations data base. However, the Agency is transferring the performance data for diethyl phthalate because the Agency believes ethyl methacrylate is easier to treat than diethyl phthalate. This is because the aromatic ring in diethyl phthalate will be more difficult to oxidize than the acrylate group in ethyl methacrylate. Hence bioxidation rates for diethyl phthalate should be slower than that of ethyl methacrylate, and removal efficiency should exceed that of diethyl phthalate.

Two data sets were available from the BAT Option II Toxics (Subcategory One) Limitations data base. The data set from plant 948V was deleted because the influent concentrations of diethyl phthalate were below the lowest concentration level (2.0 ppm) for ethyl methacrylate detected in K009 and K010 raw waste. The Agency therefore selected the only remaining data set from Plant 948F to be used for calculation of the proposed BDAT treatment standard for ethyl methacrylate.

4.2.4 1,2-Dichloroethane (surrogate for 1,1-Dichloroethane)

Performance data for 1,1-dichloroethane were not available from OW's OCPSF, BAT Option II Toxics (Subcategory One) Limitations data base. However, the Agency is transferring the performance data for 1,2-dichloroethane to 1,1-dichloroethane, which is almost identical in structure except for the different locations of the two chlorine atoms.

Nine data sets were available from the OW's OCPSF, BAT Option II Toxics (Subcategory One) Limitations data base. Data sets from plants 296V, 415T, 948F, 2631V, 3033T, and 4051V were deleted because the influent concentrations of 1,2-dichloroethane were below the lowest concentration level (29.0 ppm) for 1,1-dichloroethane detected in K009 and K010 raw waste. The data set from plant 695V was deleted because there were no influent data. The data set from plant 2631F was not used because it contained only one influent concentration data point equal to the K009 and K010 raw waste lowest concentration. The Agency selected the data set from plant 725V because it contained three data sets with influent concentrations of 1,2-dichloroethane equal to or above the lowest concentration for 1,1-dichloroethane in K009 and K010 raw waste.

4.2.5 Dichloromethane (methylene chloride)

Eight data sets were available from the OW's OCPSF, BAT Option II Toxics (Subcategory One) Limitations data base. Data sets from plants 267P, 2445P, and 2693P were deleted because they are not believed to be corrected for analytical accuracy. The data set from plant 695V had no influent data and was also deleted. The remaining four sets of data are from plants 415T, 725T, 1494V, and 2631F. The data set from plant

4.2.4 1,2-Dichloroethane (surrogate for 1,1-Dichloroethane)

Performance data for 1,1-dichloroethane were not available from OW's OCPSF, BAT Option II Toxics (Subcategory One) Limitations data base. However, the Agency is transferring the performance data for 1,2-dichloroethane to 1,1-dichloroethane, which is almost identical in structure except for the different locations of the two chlorine atoms.

Nine data sets were available from the OW's OCPSF, BAT Option II Toxics (Subcategory One) Limitations data base. Data sets from plants 296V, 415T, 948F, 2631V, 3033T, and 4051V were deleted because the influent concentrations of 1,2-dichloroethane were below the lowest concentration level (29.0 ppm) for 1,1-dichloroethane detected in K009 and K010 raw waste. The data set from plant 695V was deleted because there were no influent data. The data set from plant 2631F was not used because it contained only one influent concentration data point equal to the K009 and K010 raw waste lowest concentration. The Agency selected the data set from plant 725V because it contained three data sets with influent concentrations of 1,2-dichloroethane equal to or above the lowest concentration for 1,1-dichloroethane in K009 and K010 raw waste.

4.2.5 Dichloromethane (methylene chloride)

Eight data sets were available from the OW's OCPSF, BAT Option II Toxics (Subcategory One) Limitations data base. Data sets from plants 267P, 2445P, and 2693P were deleted because they are not believed to be corrected for analytical accuracy. The data set from plant 695V had no influent data and was also deleted. The remaining four sets of data are from plants 415T, 725T, 1494V, and 2631F. The data set from plant

1494V was used to calculate the proposed treatment standard for dichloromethane. This is because the data set from plant 1494V had the highest average influent concentration of 3.8 ppm compared to 0.04 ppm for the highest average influent concentration of the remaining three plants. The lowest concentration for dichloromethane detected in K009 and K010 raw waste was 0.005 ppm.

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Table 4-1 Treatment Performance Data

Constituent	Plant	Treatment technologies	Average influent concentration	Average effluent concentration
Acrylonitrile (surrogate for acrolein)	1494V	Steam stripping Biological (activated sludge)	890.0	<0.05
Chloroform	2631F	Steam stripping Biological (activated sludge)	35.0	0.03
1,2-Dichloroethane (surrogate for 1,1-dichloroethane)	725V	Steam stripping Biological (activated sludge)	80.0	1.2
Diethyl phthalate (surrogate for ethyl methacrylate)	948F	Biological (activated sludge)	5.0	0.03
Methylene chloride	1494V	Steam stripping Biological (activated sludge)	3.8	0.01

5. IDENTIFICATION OF BEST DEMONSTRATED AVAILABLE TECHNOLOGY (BDAT)

This section presents the Agency's rationale for determining best demonstrated available technology (BDAT) for K009 and K010 nonwastewaters and wastewaters.

To determine BDAT, the Agency examines all applicable performance data to determine whether the technologies are demonstrated. Next, EPA determines by using statistical techniques whether one or more of the technologies perform significantly better than the others. All performance data used for determination of best technology must first be adjusted for accuracy, as discussed in EPA's publication Methodology for Developing BDAT Treatment Standards. (An accuracy adjustment assesses the ability of an analytical technique to recover a particular constituent from the waste in a particular test. It is usually done by spiking a sample with a known amount of a target constituent and then comparing the amount recovered with results from unspiked samples.) BDAT must be specifically defined for all streams associated with the management of the listed waste or wastes; this pertains to the original waste as well as any residual waste stream created by the treatment process.

The technology that performs best on a particular waste or waste treatability group is then evaluated to determine whether it is "available." To be available the technology must (1) be commercially available to any generator and (2) provide "substantial" treatment of the waste as determined through evaluation of accuracy-adjusted data. In determining whether treatment is substantial, EPA may consider data on

the performance of a waste similar to the waste in question provided that the similar waste is at least as difficult to treat. If the best technology is found to be not available, then the next best technology is evaluated, and so on.

Nonwastewater forms of K009 and K010 contain more than 1 percent (weight basis) filterable solids and more than 1 percent (weight basis) total organic carbon. Wastewater forms of K009 and K010 contain less than 1 percent (weight basis) filterable solids and less than 1 percent (weight basis) total organic carbon. BDAT will be defined for all K009 and K010 nonwastewater and wastewater streams for BDAT list organics.

Nonwastewater streams from K009 and K010 include (1) the as-generated waste streams (K010 as generated is typically a nonwastewater), (2) the ash produced by incineration, (3) the scrubber water sludges generated by treatment of the scrubber wastewater, and (4) the nonwastewater generated as biomass by the biological treatment process.

Wastewater streams from K009 and K010 include (1) the as-generated K009 waste stream, (2) the scrubber water from incineration of nonwastewaters, and (3) the wastewater from steam stripping.

5.1 Nonwastewaters

In Section 3 of this document, the Agency identified incineration as a demonstrated technology to be considered for BDAT for K009 and K010 nonwastewaters. Consistent with EPA's methodology for determining BDAT, the Agency evaluated the incineration performance data for a similar

waste (K019, which the Agency believes is more difficult to treat than K009 and K010) to determine whether this technology would provide statistically significant treatment for BDAT list organic constituents in K009 and K010 wastes. Based on the evaluation of the design and operating parameters of the similar treatment system, the analytical testing, and the quality of the data, EPA determined that statistically significant treatment occurs. This determination is based on the reduction of BDAT list organic constituents to nondetectable levels in the treatment residuals. In addition to providing substantial reduction, incineration is a widely available commercial technology.

As stated in Section 4, the Agency has performance data only for incineration of K019 waste, which is believed to be similar to K009 and K010 wastes because K019 wastes (chlorinated organics) contain constituents similar to those present in K009 and K010 nonwastewaters. The Agency concludes that incineration is BDAT for K009 and K010 nonwastewaters because it has been demonstrated on a similar waste, K019, which the Agency feels is harder to treat than K009 and K010 wastes because all constituents in K009 and K010 have lower bond energies and lower boiling points than phenanthrene (2900 kcal/mole bond dissociation energy and 340°C boiling point), a constituent of K019. Phenanthrene was treated to nondetectable levels in K019 (phenanthrene's concentration in the untreated K019 wastes ranged from 11 to 21 ppm). Moreover, incineration is a widely available commercial technology.

5.2 Wastewaters

In Section 3 of this document, the Agency identified biological treatment in combination with steam stripping and/or carbon adsorption to be a demonstrated and available treatment train because this is the technology treatment train upon which the Office of Water bases its Effluent Limitations Guidelines and Standards for wastes similar to K009 and K010 wastes. EPA also identified hydrolysis followed by biological treatment to be a demonstrated and available technology because one facility uses this proprietary technology to treat K009 and K010 wastes. No data were submitted on the biological treatment portion of the facility's treatment system, nor was a complete BDAT list constituent analysis provided. The Agency was able to conclude that hydrolysis alone is not a candidate for BDAT because of the significant amounts of hazardous constituents that were shown to be generated by hydrolysis of K009 and K010 wastes. The Agency, however, is expecting the facility treating K009 and K010 waste by hydrolysis to resubmit additional treatment data on the use of its hydrolysis process in combination with other treatment processes.

Based on the above information, EPA has determined that treatment of K009 and K010 wastewaters in well-designed and well-operated biological treatment units and/or steam stripping units and/or steam stripping units followed by biological treatment represents BDAT for K009 and K010 wastewaters.

6. SELECTION OF REGULATED CONSTITUENTS

This section presents the rationale for the selection of regulated constituents for the treatment of K009 and K010 wastes.

Constituents selected for regulation must satisfy the following criteria:

1. They must be on the BDAT list of hazardous regulated constituents. This is a growing list of hazardous constituents that does not preclude the addition of new constituents as additional key parameters are identified. The list is divided into the following categories: volatile organics, semivolatile organics, metals, inorganics, organochlorine pesticides, PCBs, and dioxins and furans. The constituents in each category have similar chemical properties and are expected to behave similarly during treatment with the exception of the organics. (Presence on the BDAT list implies the existence of approved techniques for analyzing the constituent in treated waste matrices.)

2. They must be present in, or be suspected of being present in, the untreated waste. For example, in some cases, analytical difficulties (such as masking) may prevent a constituent from being identified in the untreated waste, but its identification in a treatment residual may lead the Agency to conclude that it is present in the untreated waste.

3. Where performance data are transferred from another waste, the selected constituents must be easier to treat than the waste constituent(s) for which performance data are transferred. Factors for assessing ease of treatment will vary according to the technology of concern. For example, for incineration the factors include bond dissociation energy, thermal conductivity, and boiling point.

From the group of constituents that are eligible to be regulated, EPA may select a subset of constituents as representative of the broader group. For example, out of a group of constituents that react similarly to treatment, the Agency might name only those that are the most difficult to treat as regulated constituents for the purpose of setting a standard.

6.1 Identification of BDAT List Constituents

As discussed in Sections 2 and 4, the Agency has characterization data for K009 and K010 wastes, as well as the following performance data from the treatment of similar wastes: K019 performance data for the nonwastewater organics and performance data from the Office of Water's data base from the OCPSF industries. Constituents that were not expected to be in the untreated wastes were not considered for regulation.

6.2 Constituents Selected for Regulation

The regulated constituents were selected from among those BDAT list constituents expected to be in the untreated K009 and K010 wastes that should be effectively treated by incineration for nonwastewaters, and by biological treatment and/or steam stripping and/or carbon adsorption or any combination of these technologies for wastewaters. As a general rule, any BDAT constituent expected to be present in the waste at a concentration above treatable levels would be eligible for selection.

For K009 and K010 nonwastewaters, the following constituents were selected: chloroform, 1,1-dichloroethane, and methylene chloride. The following constituents were selected for regulation in K009 and K010 wastewaters: acrolein, chloroform, 1,1-dichloroethane, ethyl acetate, ethyl methacrylate, and methylene chloride. Ethyl acetate was also selected for regulation, but a treatment standard was not considered for this constituent. The Agency reviewed the physical and chemical characteristics of ethyl acetate and determined that this constituent

would be easier to treat than ethyl methacrylate. Therefore, the Agency concluded that ethyl acetate would be effectively controlled by the regulation of ethyl methacrylate.

The organic constituents were selected for regulation because they were present (or were expected to be present) at treatable concentrations.

As mentioned in Section 2, K009 and K010 wastes contain non-BDAT list organic constituents. Some of these constituents are Appendix VIII constituents (i.e., acetylchloride, chloral, crotonaldehyde, formaldehyde, formic acid, and paraldehyde). These constituents are not included on the BDAT list because there is no EPA-approved analytical method to accurately detect their presence. Nevertheless, the Agency believes that all of these non-BDAT list Appendix VIII constituents in K009 and K010 nonwastewaters will be regulated by the regulation of the selected BDAT list constituents.

For example, the proposed treatment standards for K009 and K010 nonwastewaters were based on a transfer of performance data from the incineration of K019 nonwastewaters. K019 nonwastewaters contained phenanthrene with a bond dissociation energy (BDE) of 2,900 kcal/mole and a boiling point of 340°C. Phenanthrene was treated to nondetectable levels. None of the non-BDAT list Appendix VIII constituents present in K009 and K010 wastes have BDE or boiling points equal to or greater than those of phenanthrene. The Agency, therefore, believes that K009 and K010 nonwastewater, non-BDAT list Appendix VIII constituents will be easier to treat than K019 nonwastewater constituents. Hence, the Agency

believes that the non-BDAT list Appendix VIII constituents in K009 and K010 nonwastewaters will be adequately controlled by the regulation of the K009 and K010 BDAT list constituents.

The Agency also believes that based on their chemical structure and physical properties, these non-BDAT list Appendix VIII constituents are likely to be amenable to the same types of treatment technologies utilized for the BDAT list constituents in K009 and K010 wastewaters (i.e., biological treatment and/or steam stripping). In addition, the Agency expects that these non-BDAT list Appendix VIII constituents will be treated as effectively as were the BDAT list Appendix VIII constituents. The Agency does not expect these constituents to behave differently or to interfere with the treatment of the BDAT list Appendix VIII constituents. As mentioned in Section 2.1 of this Background Document, the Agency is also currently evaluating parameters such as BOD, COD, TOC, and total organic chlorine content for consideration as surrogates for determining whether these non-BDAT list Appendix VIII constituents will be treated.

7. DEVELOPMENT OF BDAT TREATMENT STANDARDS

The Agency bases treatment standards for regulated constituents on the performance of well-designed and well-operated BDAT treatment systems. These standards must account for analytical limitations in available performance data and must be adjusted for variabilities related to treatment, sampling, and analytical techniques and procedures.

BDAT standards are determined for each constituent by multiplying the arithmetic mean of accuracy-adjusted constituent concentrations detected in treated waste by a "variability factor" specific to each treatment technology defined as BDAT. Accuracy adjustment of performance data was discussed in Section 5 in relation to defining "substantial treatment." Variability factors correct for normal variations in the performance of a particular technology over time. They are designed to reflect the 99th percentile level of performance that the technology achieves in commercial operation. (For more information on the principles of calculating variability factors, see EPA's publication, Methodology for Developing BDAT Treatment Standards.) For details on the calculation of variability factors for K009 and K010 wastes, see Tables 7-1 and 7-2 at the end of this section.

Where EPA has identified BDAT for a particular waste, but because of data limitations or for some other compelling reason cannot define specific treatment standards for that waste, the Agency instead can require the use of that treatment process as a technology standard. Similarly, where there are no known generators of a waste, or where EPA believes that the waste can be totally recycled or reused as a raw

material, the Agency may specify a "no land disposal" standard, which effectively amounts to setting the performance standard at zero for all waste constituents.

In the case of K009 and K010 wastes, the Agency is setting treatment standards for regulated constituents as shown on Table 7-3.

7.1 Nonwastewaters

Treatment performance data for incineration of K009 and K010 nonwastewaters are not available to the Agency. Therefore, the Agency is proposing standards for the organic constituents based on performance data from incineration of K019 wastes. For the organic constituents in K009 and K010 nonwastewaters, EPA used accuracy-corrected data (analytical results multiplied by a correction factor that is the reciprocal of the lowest relevant fractional analytical spike recovery) multiplied by a variability factor. EPA is using a variability factor of 2.8 for all the volatile and semivolatile treatment standard calculations because the analytical data are less than detection limits and because a limited number of data points are available for each constituent. The variability factor accounts for variations in technology performance and waste characteristics. The treatment standard calculations for the nonwastewater organic constituents are shown on Table 7-1.

7.2 Wastewaters

Treatment performance data for K009 and K010 wastewaters are not available to the Agency; therefore, EPA is proposing standards for K009 and K010 wastewater constituents based on treatment performance data from

EPA's Office of Water, for which the Effluent Limitations Guidelines (ELGs) have been established for the Organic Chemicals, Plastics, and Synthetic Fibers Industry and are applicable to the Chemical Organic Commodity Industry. OW performance data are based on end-of-pipe biological treatment plus in-plant control technologies. The in-plant technologies for organic constituents include biological treatment, steam stripping, carbon adsorption, or any combination of these technologies. For the organic constituents in K009 and K010 wastewaters, EPA used analytical, accuracy-corrected data from the Office of Water BAT Option II Toxics (Subcategory One) Limitations data base. These data were multiplied by a variability factor that was determined by a statistical analysis of the various effluent concentrations. A variability factor of 2.8 was used when all samples were below the detection limit for the constituent and when only one data point was available (as in one case). The variability factor accounts for variations in technology performance and waste characteristics and variations in the analytical instruments. The treatment standard calculations for the wastewater organic constituents are shown on Table 7-2.

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Table 7-1 Calculation of Nonwastewater Treatment Standards (Organics) for K009 and K010 Wastes

Regulated constituent	Concentration in treated waste (ppm)	Analytical recovery correction factor	Corrected value (ppm)	Variability factor[a]	Treatment standard (ppm)
Chloroform	<2	1.07	2.14	2.8	6.0
1,1-dichloroethane	<2	1.07	2.14	2.8	6.0
Methylene chloride	<10	1.07	10.7	2.8	30.0

[a]Variability factor of 2.8 is used when all samples are below the detection limit for the constituent.

Table 7-1 Calculation of Wastewater Treatment Standards for K009 and K010

Regulated constituent	Average concentration in treated waste (ppm)	Variability factor	Treatment standard (ppm)
Acrolein[a]	<0.05	2.8[b]	0.14
Chloroform	0.03	3.3	0.09
1,1-Dichloroethane[c]	1.2	4.3	5.3
Ethyl methacrylate[d]	0.03	5.4	0.16
Methylene chloride	0.01	2.8	0.03

[a]Acrylonitrile was used as a surrogate for acrolein.

[b]Only one data point was used to establish the proposed treatment standard because it was the only data point with an influent concentration greater than acrolein's concentration in K009/K010 untreated wastewaters (i.e., 870 ppm). The variability factor of 2.8 is assigned when there is only one data point.

[c]1,2-Dichloroethane was used as a surrogate for 1,1-dichloroethane.

[d]Diethyl phthalate was used as a surrogate for ethyl methacrylate.

Table 7-3 BDAT Treatment Standards for K009 and K010

Nonwastewaters

Constituent	Maximum for any single grab sample: Total composition (mg/kg)	Maximum for any single grab sample: TCLP (mg/l)
Chloroform	6.0	Not Applicable
1,1-Dichloroethane	6.0	Not Applicable
Methylene chloride	30.0	Not Applicable

Wastewaters

Constituent	Maximum for any single grab sample: Total composition (mg/l)	Maximum for any single grab sample: TCLP (mg/l)
Acrolein	0.14	Not Applicable
Chloroform	0.09	Not Applicable
1,1-Dichloroethane	5.3	Not Applicable
Ethyl methacrylate	0.18	Not Applicable
Methylene chloride	0.03	Not Applicable

8. REFERENCES

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APPENDIX A

Waste Characteristics Affecting Performance

List of Boiling Points and Bond Dissociation Energies for Constituents of Concern in K009 and K010 Wastes

APPENDIX A

Constituent	Bond dissociation energy (kcal/mole)	Reference	Boiling point (°C)	Reference
BDAT Constituent				
Acrolein	805	1,2,3	52.5-53.5	1
Acrylonitrile	860	1,2,3	77.5-79	1
Benzene	1335	1,2,3	80.1	1
Chloroform	350	1,2,3	61-61.2	1
1,1-Dichloroethane	645	1,2,3	57-57.3	1
1,2-Dichloroethane	645	1,2,3	83-84	1
2,4-Dinitrophenol	1530	1,2,3	209	1
Ethyl acetate	1305	1,2,3	76-77	1
Ethyl methacrylate	1735	1,2,3	118-119	1
Methyl chloride	380	1,2,3	-24	1
Methylene chloride	360	1,2,3	39.8-40	1
Napthalene	2095	1,2,3	217.9-218	1
Pentachlorophenol	1410	1,2,3	309	1
Phenanthrene[a]	2900	1,2,3	340	1
Toluene	1410	1,2,3	111	1
Non-BDAT Constituent				
Acetaldehyde	660	1,2,3	20.8	1
Acetic acid	755	1,2,3	117.9	1
Acetyl chloride	640	1,2,3	50.9	1
Chloral	600	1,2,3	97.8	1
Chloroacetaldehyde	640	1,2,3	157	1
Crotonaldehyde	1090	1,2,3	104-105	1
Dichloroacetaldehyde	620	1,2,3	90-91	1
Formaldehyde	375	1,2,3	-21	1
Paraldehyde	1935	1,2,3	128	1

[a]Phenanthrene is present in K019 waste with a higher bond dissociation energy and higher boiling point than those of any of the constituents present or suspected to be present in K009 and K010 wastes.

Sources:

1 - CRC Handbook of Chemistry and Physics, 65th Edition.
2 - Sanderson, R.T. Chemical Bonds and Bond Energy
3 - Lange's Handbook of Chemistry

APPENDIX B

Performance Data Base: From the Office of Water BAT Option II Toxics (Subcategory One) Limitations Data Base

LISTING OF EDITED BAT OPTION II (TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

POLLUTANT NUMBER =3 PLANT =063V

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
26	ACRYLONITRILE	36770		INF	06/12/79	150		EFF	50
27	ACRYLONITRILE	33810		INF	06/13/79	59		EFF	50
28	ACRYLONITRILE	21310		INF	06/14/79	151		EFF	50

POLLUTANT NUMBER =3 PLANT =948F

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
29	ACRYLONITRILE	20500		INF	06/18/80		ND	EFF	50
30	ACRYLONITRILE	600		INF	06/19/80		ND	EFF	50
31	ACRYLONITRILE	13500		INF	06/20/80		ND	EFF	50
32	ACRYLONITRILE	4000		INF	06/23/80		ND	EFF	50
33	ACRYLONITRILE	10050		INF	06/24/80		ND	EFF	50
34	ACRYLONITRILE	10235		INF	06/25/80		ND	EFF	50
35	ACRYLONITRILE	500		INF	06/26/80		ND	EFF	50
36	ACRYLONITRILE	1040		INF	06/27/80		ND	EFF	50
37	ACRYLONITRILE	40000		INF	07/07/80		ND	EFF	50
38	ACRYLONITRILE	18050		INF	07/08/80		ND	EFF	50
39	ACRYLONITRILE	25000		INF	07/09/80		ND	EFF	50
40	ACRYLONITRILE	27000		INF	07/10/80		ND	EFF	50
41	ACRYLONITRILE	13525		INF	07/11/80		ND	EFF	50
42	ACRYLONITRILE	33000		INF	07/14/80		ND	EFF	50
43	ACRYLONITRILE	111000		INF	07/15/80		ND	EFF	50
44	ACRYLONITRILE	110000		INF	07/16/80		ND	EFF	50
45	ACRYLONITRILE	890000		INF	07/17/80		ND	EFF	50
46	ACRYLONITRILE	352000		INF	07/18/80		ND	EFF	50
47	ACRYLONITRILE	290		INF	07/21/80		ND	EFF	50
48	ACRYLONITRILE	6115		INF	07/22/80		ND	EFF	50
49	ACRYLONITRILE	37000		INF	07/23/80		ND	EFF	50
50	ACRYLONITRILE		ND	INF	07/24/80		ND	EFF	50
51	ACRYLONITRILE	225000		INF	07/25/80		ND	EFF	50
52	ACRYLONITRILE	26000		INF	07/28/80		ND	EFF	50
53	ACRYLONITRILE	15000		INF	07/30/80		ND	EFF	50
54	ACRYLONITRILE	16000		INF	07/31/80		ND	EFF	50
55	ACRYLONITRILE	156000		INF	08/01/80		ND	EFF	50
56	ACRYLONITRILE	17250		INF	08/04/80		ND	EFF	50
57	ACRYLONITRILE	13250		INF	08/05/80		ND	EFF	50
58	ACRYLONITRILE	15000		INF	08/06/80		ND	EFF	50
59	ACRYLONITRILE	16000		INF	08/07/80		ND	EFF	50

1890V AND =1890V ARE TWO DIFFERENT TREATMENT SYSTEMS
FROM THE SAME PLANT

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115332

LISTING OF EDITED DAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

---------- POLLUTANT NUMBER =3 PLANT =940F ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
60	ACRYLONITRILE	650		INF	08/08/80		ND	EFF	50

---------- POLLUTANT NUMBER =3 PLANT =948V ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
61	ACRYLONITRILE	34940		INF	05/15/79	.	ND	EFF	50
62	ACRYLONITRILE	110000		INF	05/16/79	.	ND	EFF	50

---------- POLLUTANT NUMBER =3 PLANT =1349V ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
63	ACRYLONITRILE	5000		INF	06/12/79	.	ND	EFF	50
64	ACRYLONITRILE	1200		INF	06/13/79	.	ND	EFF	50

---------- POLLUTANT NUMBER =3 PLANT =2536T ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
65	ACRYLONITRILE	165000		HSIF	05/15/83	.	ND	SCF	50
66	ACRYLONITRILE	195200		HSIF	05/16/83	.	ND	SCF	50
67	ACRYLONITRILE	77976		HSIF	05/17/83	.	ND	SCF	50
68	ACRYLONITRILE	163600		HSIF	05/18/83	.	ND	SCF	50
69	ACRYLONITRILE	137400		HSIF	05/19/83	.	ND	SCF	50
70	ACRYLONITRILE	43496		HSIF	05/22/83	.	ND	SCF	50
71	ACRYLONITRILE	191000		HSIF	05/23/83	.	ND	SCF	50
72	ACRYLONITRILE	234100		HSIF	05/24/83	.	ND	SCF	50
73	ACRYLONITRILE	92960		HSIF	05/25/83	.	ND	SCF	50
74	ACRYLONITRILE	216700		HSIF	05/26/83	.	ND	SCF	50
75	ACRYLONITRILE	246700		HSIF	05/29/83	.	ND	SCF	50
76	ACRYLONITRILE	414785		HSIF	05/30/83	.	ND	SCF	50
77	ACRYLONITRILE	380870		HSIF	05/31/83	.	ND	SCF	50

1890V AND =1890V ARE TWO DIFFERENT TREATMENT SYSTEMS
FROM THE SAME PLANT

115333

LISTING OF EDITED DAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

---------- POLLUTANT NUMBER =3 PLANT =2536T ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (MD)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (MD)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
78	ACRYLONITRILE	386680		HSTF	06/01/83	.	MD	SCF	50
79	ACRYLONITRILE	199700		HSTF	06/02/83	.	MD	SCF	50

1890V AND =1890V ARE TWO DIFFERENT TREATMENT SYSTEMS FROM THE SAME PLANT

LISTING OF EDITED DAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

POLLUTANT NUMBER =23 PLANT =415T

005	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (UG)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (UG)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
851	CHLOROFORM	.	10	EC-I	11/29/83	.	10	32-A	10
852	CHLOROFORM	.	10	EC-I	11/30/83	.	10	32-A	10
853	CHLOROFORM	84		EC-I	12/01/83	.	10	32-A	10
854	CHLOROFORM	22		EC-I	12/02/83	29		32-A	10
855	CHLOROFORM	28		EC-I	12/03/83	.	10	32-A	10
856	CHLOROFORM	135		EC-I	12/04/83	19		32-A	10
857	CHLOROFORM	.	10	EC-I	12/05/83	31		32-A	10
858	CHLOROFORM	10		EC-I	12/06/83	22		32-A	10
859	CHLOROFORM	573		EC-I	12/07/83	20		32-A	10
860	CHLOROFORM	29		EC-I	12/08/83	84		32-A	10
861	CHLOROFORM	12		EC-I	12/11/83	47		32-A	10
862	CHLOROFORM	21		EC-I	12/12/83	37		32-A	10
863	CHLOROFORM	.	10	EC-I	12/13/83	18		32-A	10
864	CHLOROFORM	14		EC-I	12/14/83	11		32-A	10
865	CHLOROFORM	.	10	EC-I	12/15/83	11		32-A	10
								32-A	10

POLLUTANT NUMBER =23 PLANT =695V

005	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (UG)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (UG)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
866	CHLOROFORM	.			12/04/78	.	10	EFF	10
867	CHLOROFORM	.			12/05/78	.	10	EFF	10
868	CHLOROFORM	.			12/06/78	.	10	EFF	10

POLLUTANT NUMBER =23 PLANT =725T

005	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (UG)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (UG)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
869	CHLOROFORM	79		PCI	05/22/83	.	10	SCF	10
870	CHLOROFORM	121		PCI	05/23/83	.	10	SCF	10
871	CHLOROFORM	155		PCI	05/24/83	.	10	SCF	10
872	CHLOROFORM	171.		PCI	05/25/83	.	10	SCF	10
873	CHLOROFORM	166		PCI	05/26/83	.	10	SCF	10
874	CHLOROFORM	193		PCI	05/29/83	.	10	SCF	10
875	CHLOROFORM	303		PCI	05/30/83	.	10	SCF	10
876	CHLOROFORM	304		PCI	05/31/83	.	10	SCF	10

1690V AND =1690V ARE TWO DIFFERENT TREATMENT SYSTEMS
FROM THE SAME PLANT

115364

LISTING OF EDITED DAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

---------- POLLUTANT NUMBER =23 PLANT =725T ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (MD)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (MD)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
877	CHLOROFORM	232		PCI	06/01/83	.	MD	SCF	10
878	CHLOROFORM	349		PCI	06/02/83	.	MD	SCF	10
879	CHLOROFORM	373		PCI	06/05/83	.	MD	SCF	10
880	CHLOROFORM	302		PCI	06/06/83	.	MD	SCF	10
881	CHLOROFORM	247		PCI	06/07/83	.	MD	SCF	10
882	CHLOROFORM	375		PCI	06/09/83	.	MD	SCF	10

---------- POLLUTANT NUMBER =23 PLANT =725V ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (MD)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (MD)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
883	CHLOROFORM	1029		INF	01/28/80	.	MD	EFF	10
884	CHLOROFORM	1500		INF	01/29/80	.	MD	EFF	10
885	CHLOROFORM	2650		INF	01/30/80		MD	EFF	10

---------- POLLUTANT NUMBER =23 PLANT =1609V ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (MD)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (MD)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
866	CHLOROFORM	217		INF	09/11/78	.	MD	EFF	10
867	CHLOROFORM	670		INF	09/12/78	.	MD	EFF	10
868	CHLOROFORM	248		INF	09/13/78	.	MD	EFF	10

1609V AND =1690V ARE TWO DIFFERENT TREATMENT SYSTEMS FROM THE SAME PLANT

LISTING OF EDITED BAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

POLLUTANT NUMBER =23 PLANT =2631F

DBS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
889	CHLOROFORM	46		INF	06/02/80	.	ND	EFF	10
890	CHLOROFORM	49		INF	06/03/80	.	ND	EFF	10
891	CHLOROFORM	2705		INF	06/04/80	18		EFF	10
892	CHLOROFORM	496		INF	06/05/80	22		EFF	10
893	CHLOROFORM	942		INF	06/09/80	19		EFF	10
894	CHLOROFORM	3227		INF	06/10/80	15		EFF	10
895	CHLOROFORM	1169		INF	06/11/80	22		EFF	10
896	CHLOROFORM	105		INF	06/12/80	.	ND	EFF	10
897	CHLOROFORM	4238		INF	06/16/80	31		EFF	10
898	CHLOROFORM	4215		INF	06/17/80	42		EFF	10
899	CHLOROFORM	5250		INF	06/18/80	48		EFF	10
900	CHLOROFORM	4665		INF	06/19/80	68		EFF	10
901	CHLOROFORM	1790		INF	06/23/80	14		EFF	10
902	CHLOROFORM	2438		INF	06/24/80	14		EFF	10
903	CHLOROFORM	2078		INF	06/25/80	16		EFF	10
904	CHLOROFORM	2184		INF	06/26/80	15		EFF	10
905	CHLOROFORM	1480		INF	06/30/80	.	ND	EFF	10
906	CHLOROFORM	681		INF	07/01/80	.	ND	EFF	10
907	CHLOROFORM	302		INF	07/02/80	.	ND	EFF	10
908	CHLOROFORM	542		INF	07/03/80	10		EFF	10
909	CHLOROFORM	408		INF	07/07/80	14		EFF	10
910	CHLOROFORM	123		INF	07/08/80	.	ND	EFF	10
911	CHLOROFORM	162		INF	07/09/80	.	ND	EFF	10
912	CHLOROFORM	165		INF	07/10/80	.	ND	EFF	10

POLLUTANT NUMBER =23 PLANT =2631V

DBS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
913	CHLOROFORM	552		INF	01/16/79	.	ND	EFF	10
914	CHLOROFORM	1000		INF	01/17/79	26		EFF	10
915	CHLOROFORM	710		INF	01/18/79	12		EFF	10

1690V AND =1690V ARE TWO DIFFERENT TREATMENT SYSTEMS
FROM THE SAME PLANT

115366

LISTING OF EDITED DAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

---------- POLLUTANT NUMBER =23 PLANT =2693P ----------

OBS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (1=0)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (1=0)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
916	CHLOROFORM	.			03/07/83	20		EE11A	10
917	CHLOROFORM	.			03/13/83	23		EE11A	10
918	CHLOROFORM	.			03/21/83	41		EE11A	10
919	CHLOROFORM	.			03/27/83	68		EE11A	10

1890V AND =1890V ARE TWO DIFFERENT TREATMENT SYSTEMS FROM THE SAME PLANT

116367

LISTING OF EDITED DAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

---------- POLLUTANT NUMBER =10 PLANT =296V ----------

ODS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (MD)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (MD)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
647	1,2-DICHLOROETHANE	1967		INF	02/20/79	.	MD	EFF	10
648	1,2-DICHLOROETHANE	670		INF	02/21/79	16		EFF	10
649	1,2-DICHLOROETHANE	445		INF	02/22/79	17		EFF	10

---------- POLLUTANT NUMBER =10 PLANT =415T ----------

ODS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (MD)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (MD)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
650	1,2-DICHLOROETHANE	13		EC-I	11/29/83	63		32-A	10
651	1,2-DICHLOROETHANE	53		EC-I	11/30/83	22		32-A	10
652	1,2-DICHLOROETHANE	57		EC-I	12/01/83	47		32-A	10
653	1,2-DICHLOROETHANE	49		EC-I	12/02/83	85		32-A	10
654	1,2-DICHLOROETHANE	71		EC-I	12/03/83	27		32-A	10
655	1,2-DICHLOROETHANE	1468		EC-I	12/04/83	13		32-A	10
656	1,2-DICHLOROETHANE	120		EC-I	12/05/83	.	MD	32-A	10
657	1,2-DICHLOROETHANE	42		EC-I	12/06/83	.	MD	32-A	10
658	1,2-DICHLOROETHANE	3388		EC-I	12/07/83	13		32-A	10
659	1,2-DICHLOROETHANE	200		EC-I	12/08/83	770		32-A	10
660	1,2-DICHLOROETHANE	1991		EC-I	12/11/83	.	MD	32-A	10
661	1,2-DICHLOROETHANE	61		EC-I	12/12/83	48		32-A	10
662	1,2-DICHLOROETHANE	.	MD	EC-I	12/13/83	.	MD	32-A	10
663	1,2-DICHLOROETHANE	139		EC-I	12/14/83	.	MD	32-A	10
664	1,2-DICHLOROETHANE	144		EC-I	12/15/83	140		32-A	10

---------- POLLUTANT NUMBER =10 PLANT =695V ----------

ODS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (MD)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (MD)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
665	1,2-DICHLOROETHANE	.			12/04/78	.	MD	EFF	10
666	1,2-DICHLOROETHANE	.			12/05/78	.	MD	EFF	10
667	1,2-DICHLOROETHANE	.			12/06/78	15		EFF	10

1690V AND =1690V ARE TWO DIFFERENT TREATMENT SYSTEMS FROM THE SAME PLANT

115354

LISTING OF EDITED DAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

---------- POLLUTANT NUMBER =10 PLANT =725\ ----------

005	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
668	1,2-DICHLOROETHANE	59450		INF	01/28/80	760		EFF	10
669	1,2-DICHLOROETHANE	98500		INF	01/29/80	2300		EFF	10
670	1,2-DICHLOROETHANE	81000		INF	01/30/80	625		EFF	10

---------- POLLUTANT NUMBER =10 PLANT =940F ----------

005	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
671	1,2-DICHLOROETHANE	.	ND	INF	06/18/80	.	ND	EFF	10
672	1,2-DICHLOROETHANE	10		INF	06/19/80	.	ND	EFF	10
673	1,2-DICHLOROETHANE	.	ND	INF	06/20/80	13		EFF	10
674	1,2-DICHLOROETHANE	110		INF	06/23/80	.	ND	EFF	10
675	1,2-DICHLOROETHANE	1670		INF	06/24/80	.	ND	EFF	10
676	1,2-DICHLOROETHANE	410		INF	06/25/80	26		EFF	10
677	1,2-DICHLOROETHANE	3900		INF	06/26/80	50		EFF	10
678	1,2-DICHLOROETHANE	570		INF	06/27/80	11		EFF	10
679	1,2-DICHLOROETHANE	.	ND	INF	07/07/80	.	ND	EFF	10
680	1,2-DICHLOROETHANE	.	ND	INF	07/08/80	.	ND	EFF	10
681	1,2-DICHLOROETHANE	.	ND	INF	07/09/80	.	ND	EFF	10
682	1,2-DICHLOROETHANE	.	ND	INF	07/10/80	.	ND	EFF	10
683	1,2-DICHLOROETHANE	.	ND	INF	07/11/80	.	ND	EFF	10
684	1,2-DICHLOROETHANE	.	ND	INF	07/14/80	.	ND	EFF	10
685	1,2-DICHLOROETHANE	.	ND	INF	07/15/80	.	ND	EFF	10
686	1,2-DICHLOROETHANE	.	ND	INF	07/16/80	.	ND	EFF	10
687	1,2-DICHLOROETHANE	.	ND	INF	07/17/80	.	ND	EFF	10
688	1,2-DICHLOROETHANE	.	ND	INF	07/18/80	.	ND	EFF	10
689	1,2-DICHLOROETHANE	.	ND	INF	07/21/80	.	ND	EFF	10
690	1,2-DICHLOROETHANE	183		INF	07/22/80	.	ND	EFF	10
691	1,2-DICHLOROETHANE	.	ND	INF	07/23/80	.	ND	EFF	10
692	1,2-DICHLOROETHANE	35		INF	07/24/80	.	ND	EFF	10
693	1,2-DICHLOROETHANE	.	ND	INF	07/25/80	.	ND	EFF	10
694	1,2-DICHLOROETHANE	.	ND	INF	07/28/80	.	ND	EFF	10
695	1,2-DICHLOROETHANE	.	ND	INF	07/29/80	.	ND	EFF	10
696	1,2-DICHLOROETHANE	.	ND	INF	07/30/80	.	ND	EFF	10
697	1,2-DICHLOROETHANE	.	ND	INF	07/31/80	.	ND	EFF	10
698	1,2-DICHLOROETHANE	.	ND	INF	08/01/80	.	ND	EFF	10
699	1,2-DICHLOROETHANE	409		INF	08/04/80	.	ND	EFF	10
700	1,2-DICHLOROETHANE	618		INF	08/05/80	12		EFF	10
701	1,2-DICHLOROETHANE	380		INF	08/06/80	.	ND	EFF	10

1690V AND =1690V ARE TWO DIFFERENT TREATMENT SYSTEMS
FROM THE SAME PLANT

115355

LISTING OF EDITED BAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

POLLUTANT NUMBER =10 PLANT =940F

OBS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
702	1,2-DICHLOROETHANE	3500		INF	08/07/80	11		EFF	10
703	1,2-DICHLOROETHANE	272		INF	08/08/80	15		EFF	10

POLLUTANT NUMBER =10 PLANT =2631F

OBS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
704	1,2-DICHLOROETHANE	489		INF	06/02/80	.	ND	EFF	10
705	1,2-DICHLOROETHANE	298		INF	06/03/80	13		EFF	10
706	1,2-DICHLOROETHANE	7760		INF	06/04/80	163		EFF	10
707	1,2-DICHLOROETHANE	468		INF	06/05/80	180		EFF	10
708	1,2-DICHLOROETHANE	530		INF	06/09/80	.	ND	EFF	10
709	1,2-DICHLOROETHANE	282		INF	06/10/80	17		EFF	10
710	1,2-DICHLOROETHANE	265		INF	06/11/80	.	ND	EFF	10
711	1,2-DICHLOROETHANE	314		INF	06/12/80	.	ND	EFF	10
712	1,2-DICHLOROETHANE	753		INF	06/16/80	.	ND	EFF	10
713	1,2-DICHLOROETHANE	433		INF	06/17/80	.	ND	EFF	10
714	1,2-DICHLOROETHANE	497		INF	06/18/80	.	ND	EFF	10
715	1,2-DICHLOROETHANE	375		INF	06/19/80	.	ND	EFF	10
716	1,2-DICHLOROETHANE	947		INF	06/23/80	.	ND	EFF	10
717	1,2-DICHLOROETHANE	990		INF	06/24/80	10		EFF	10
718	1,2-DICHLOROETHANE	616		INF	06/25/80	10		EFF	10
719	1,2-DICHLOROETHANE	516		INF	06/26/80	.	ND	EFF	10
720	1,2-DICHLOROETHANE	666		INF	06/30/80	.	ND	EFF	10
721	1,2-DICHLOROETHANE	463		INF	07/01/80	.	ND	EFF	10
722	1,2-DICHLOROETHANE	29500		INF	07/02/80	16		EFF	10
723	1,2-DICHLOROETHANE	804		INF	07/03/80	91		EFF	10
724	1,2-DICHLOROETHANE	461		INF	07/07/80	.	ND	EFF	10
725	1,2-DICHLOROETHANE	452		INF	07/08/80	.	ND	EFF	10
726	1,2-DICHLOROETHANE	418		INF	07/09/80	.	ND	EFF	10
727	1,2-DICHLOROETHANE	313		INF	07/10/80	.	ND	EFF	10

1890V AND =1890V ARE TWO DIFFERENT TREATMENT SYSTEMS FROM THE SAME PLANT

115356

LISTING OF EDITED DAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

---------- POLLUTANT NUMBER =10 PLANT =2631V ----------

OBS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (1=0)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (1=0)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
728	1,2-DICHLOROETHANE	775		INF	01/16/79	66		EFF	10

---------- POLLUTANT NUMBER =10 PLANT =3033T ----------

OBS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (1=0)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (1=0)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
729	1,2-DICHLOROETHANE	92		INH	06/12/83	.	10	SPF	10
730	1,2-DICHLOROETHANE	93		INH	06/13/83	.	10	SPF	10
731	1,2-DICHLOROETHANE	193		INH	06/14/83	.	10	SPF	10
732	1,2-DICHLOROETHANE	140		INH	06/15/83	.	10	SPF	10
733	1,2-DICHLOROETHANE	143		INH	06/16/83	.	10	SPF	10
734	1,2-DICHLOROETHANE	179		INH	06/19/83	.	10	SPF	10
735	1,2-DICHLOROETHANE	159		INH	06/20/83	.	10	SPF	10
736	1,2-DICHLOROETHANE	300		INH	06/21/83	.	10	SPF	10
737	1,2-DICHLOROETHANE	145		INH	06/22/83	.	10	SPF	10
738	1,2-DICHLOROETHANE	344		INH	06/23/83	.	10	SPF	10
739	1,2-DICHLOROETHANE	99		INH	06/26/83	.	10	SPF	10
740	1,2-DICHLOROETHANE	106		INH	06/27/83		10	SPF	10

---------- POLLUTANT NUMBER =10 PLANT =4051V ----------

OBS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (1=0)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (1=0)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
741	1,2-DICHLOROETHANE	1534		INF	04/23/79	1016		EFF	10

1890V AND =1890V ARE TWO DIFFERENT TREATMENT SYSTEMS FROM THE SAME PLANT

115657

LISTING OF EDITED DAT OPTION# 11 TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

---------- POLLUTANT NUMBER =44 PLANT =267P ----------

OBS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
1795	DICHLOROMETHANE	2227		IE1B	02/06/85	.	ND	EE1B	10
1796	DICHLOROMETHANE	3654		IE1B	02/07/85	.	ND	EE1B	10
1797	DICHLOROMETHANE	13200		IE1B	02/11/85	107		EE1B	10
1798	DICHLOROMETHANE	7191		IE1B	02/12/85	317		EE1B	10
1799	DICHLOROMETHANE	10605		IE1B	02/13/85	22		EE1B	10
1800	DICHLOROMETHANE	5961		IE1B	02/25/85	14		EE1B	10
1801	DICHLOROMETHANE	10000		IE1B	02/26/85	119		EE1B	10
1802	DICHLOROMETHANE	7660		IE1B	02/27/85	.	ND	EE1B	10
1803	DICHLOROMETHANE	2309		IE1B	03/04/85	10		EE1B	10
1804	DICHLOROMETHANE	4909		IE1B	03/05/85	.	ND	EE1B	10
1805	DICHLOROMETHANE	3640		IE1B	03/12/85	.	ND	EE1B	10
1806	DICHLOROMETHANE	4980		IE1B	03/14/85	.	ND	EE1B	10
1807	DICHLOROMETHANE	7535		IE1B	03/18/85	.	ND	EE1B	10
1808	DICHLOROMETHANE	1002		IE1B	03/19/85	.	ND	EE1B	10
1809	DICHLOROMETHANE	3264		IE1B	03/21/85	10		EE1B	10
1810	DICHLOROMETHANE	3602		IE1B	03/25/85	.	ND	EE1B	10
1811	DICHLOROMETHANE	2032		IE1B	04/02/85	.	ND	EE1B	10
1812	DICHLOROMETHANE	5078		IE1B	04/11/85	20		EE1B	10
1813	DICHLOROMETHANE	1671		IE1B	04/12/85	77		EE1B	10
1814	DICHLOROMETHANE	4567		IE1B	04/23/85	39		EE1B	10
1815	DICHLOROMETHANE	2503		IE1B	04/24/85	37		EE1B	10
1816	DICHLOROMETHANE	5545		IE1B	04/29/85	93		EE1B	10
1817	DICHLOROMETHANE	4403		IE1B	05/06/85	456		EE1B	10
1818	DICHLOROMETHANE	9878		IE1B	05/07/85	74		EE1B	10
1819	DICHLOROMETHANE	1481		IE1B	05/09/85	.	ND	EE1B	10
1820	DICHLOROMETHANE	2030		IE1B	05/13/85	92		EE1B	10
1821	DICHLOROMETHANE	1103		IE1B	05/14/85	63		EE1B	10
1822	DICHLOROMETHANE	1118		IE1B	05/15/85	41		EE1B	10
1823	DICHLOROMETHANE	1119		IE1B	05/16/85	56		EE1B	10
1824	DICHLOROMETHANE	3371		IE1B	05/20/85	42		EE1B	10
1825	DICHLOROMETHANE	1325		IE1B	05/23/85	19		EE1B	10
1826	DICHLOROMETHANE	1870		IE1B	05/30/85	77		EE1B	10
1827	DICHLOROMETHANE	2484		IE1B	06/03/85	82		EE1B	10
1828	DICHLOROMETHANE	1944		IE1B	06/04/85	13		EE1B	10
1829	DICHLOROMETHANE	1975		IE1B	06/05/85	.	ND	EE1B	10
1830	DICHLOROMETHANE	2773		IE1B	06/06/85	.	ND	EE1B	10
1831	DICHLOROMETHANE	2805		IE1B	06/10/85	45		EE1B	10
1832	DICHLOROMETHANE	3042		IE1B	06/11/85	.	ND	EE1B	10
1833	DICHLOROMETHANE	1015		IE1B	06/12/85	.	ND	EE1B	10
1834	DICHLOROMETHANE	1079		IE1B	06/26/85	71		EE1B	10

1890V AND =1890V ARE TWO DIFFERENT TREATMENT SYSTEMS FROM THE SAME PLANT

115419.

LISTING OF EDITED BAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

---------- POLLUTANT NUMBER =44 PLANT =41ST ----------

ID	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
835	DICHLOROMETHANE	.	ND	EC-I	11/29/83	.	ND	32-A	10
836	DICHLOROMETHANE	.	ND	EC-I	11/30/83	.	ND	32-A	10
837	DICHLOROMETHANE	.	ND	EC-I	12/01/83	.	ND	32-A	10
838	DICHLOROMETHANE	.	ND	EC-I	12/02/83	.	ND	32-A	10
839	DICHLOROMETHANE	.	ND	EC-I	12/03/83	.	ND	32-A	10
840	DICHLOROMETHANE	.	ND	EC-I	12/04/83	.	ND	32-A	10
841	DICHLOROMETHANE	.			12/05/83	.	ND	32-A	10
842	DICHLOROMETHANE	.	ND	EC-I	12/06/83	.	ND	32-A	10
843	DICHLOROMETHANE	.	ND	EC-I	12/07/83	.	ND	32-A	10
844	DICHLOROMETHANE	.	ND	EC-I	12/08/83	.	ND	32-A	10
845	DICHLOROMETHANE	12		EC-I	12/11/83	.	ND	32-A	10
846	DICHLOROMETHANE	38		EC-I	12/12/83	.	ND	32-A	10
847	DICHLOROMETHANE	44		EC-I	12/13/83	.	ND	32-A	10
848	DICHLOROMETHANE	19		EC-I	12/14/83	.	ND	32-A	10
849	DICHLOROMETHANE	54		EC-I	12/15/83	.	ND	32-A	10

---------- POLLUTANT NUMBER =44 PLANT =695V ----------

ID	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
850	DICHLOROMETHANE	.			12/04/78	570		EFF	10
851	DICHLOROMETHANE	.			12/05/78	10		EFF	10
852	DICHLOROMETHANE	.			12/06/78	40		EFF	10

---------- POLLUTANT NUMBER =44 PLANT =725T ----------

ID	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
853	DICHLOROMETHANE	30		PCI	05/22/83	27		SCF	10
1854	DICHLOROMETHANE	31		PCI	05/23/83	26		SCF	10
1855	DICHLOROMETHANE	28		PCI	05/24/83	58		SCF	10
856	DICHLOROMETHANE	65		PCI	05/25/83	20		SCF	10
857	DICHLOROMETHANE	37		PCI	05/26/83	29		SCF	10
858	DICHLOROMETHANE	42		PCI	05/29/83	32		SCF	10
859	DICHLOROMETHANE	37		PCI	05/30/83	33		SCF	10
860	DICHLOROMETHANE	18		PCI	05/31/83	35		SCF	10

1890V AND =1890V ARE TWO DIFFERENT TREATMENT SYSTEMS
FROM THE SAME PLANT

115420

LISTING OF EDITED DAT OPTION II TOXICS
(SUBCATEGORY ONLY LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PHASIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

---------- POLLUTANT NUMBER =44 PLANT =7251 ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (NO)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (NO)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
1861	DICHLOROMETHANE	34		PCI	06/01/83	29		SCF	10
1862	DICHLOROMETHANE	13		PCI	06/02/83	.	NO	SCF	10
1863	DICHLOROMETHANE	25		PCI	06/05/83	.	NO	SCF	10
1864	DICHLOROMETHANE	.	NO	PCI	06/06/83	.	NO	SCF	10
1865	DICHLOROMETHANE	.	NO	PCI	06/07/83	.	NO	SCF	10
1866	DICHLOROMETHANE	.	NO	PCI	06/09/83		NO	SCF	10

---------- POLLUTANT NUMBER =44 PLANT =1494V ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (NO)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (NO)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
1867	DICHLOROMETHANE	5550		INF	05/22/79	10		EFF	10
1868	DICHLOROMETHANE	3005		INF	05/23/79	10		EFF	10
1869	DICHLOROMETHANE	2900		INF	05/24/79	10		EFF	10

---------- POLLUTANT NUMBER =44 PLANT =2445P ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (NO)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (NO)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
1870	DICHLOROMETHANE	450		ED3A	02/12/82	.	NO	EE11A	10
1871	DICHLOROMETHANE	1000		ED3A	03/17/82	.	NO	EE11A	10
1872	DICHLOROMETHANE	7900		ED3A	04/14/82	.	NO	EE11A	10
1873	DICHLOROMETHANE	19000		ED3A	05/05/82	.	NO	EE11A	10
1874	DICHLOROMETHANE	2300		ED3A	06/15/82	16		EE11A	10
1875	DICHLOROMETHANE	3500		ED3A	07/13/82	66		EE11A	10
1876	DICHLOROMETHANE	8000		ED3A	08/31/82	162		EE11A	10
1877	DICHLOROMETHANE	4000		ED3A	10/10/82	.	NO	EE11A	10
1878	DICHLOROMETHANE	11000		ED3A	11/10/82	.	NO	EE11A	10
1879	DICHLOROMETHANE	8000		ED3A	12/00/82	.	NO	EE11A	10

1890V AND =1890V ARE TWO DIFFERENT TREATMENT SYSTEMS
FROM THE SAME PLANT

115421

LISTING OF EDITED DAT OPTION II TO4LC3
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

---------- POLLUTANT NUMBER =44 PLANT =2631F ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
								EFF	10
1880	DICHLOROMETHANE	86		INF	06/02/80	19		EFF	10
1881	DICHLOROMETHANE	19		INF	06/03/80	12		EFF	10
1882	DICHLOROMETHANE	.	ND	INF	06/04/80	14		EFF	10
1883	DICHLOROMETHANE	.	ND	INF	06/05/80	.	ND	EFF	10
1884	DICHLOROMETHANE	14		INF	06/09/80	14		EFF	10
1885	DICHLOROMETHANE	27		INF	06/10/80	.	ND	EFF	10
1886	DICHLOROMETHANE	16		INF	06/11/80	10		EFF	10
1887	DICHLOROMETHANE	48		INF	06/12/80	12		EFF	10
1888	DICHLOROMETHANE	25		INF	06/16/80	15		EFF	10
1889	DICHLOROMETHANE	16		INF	06/17/80	34		EFF	10
1890	DICHLOROMETHANE	11		INF	06/18/80	19		EFF	10
1891	DICHLOROMETHANE	.	ND	INF	06/19/80	14		EFF	10
1892	DICHLOROMETHANE	15		INF	06/23/80	.	ND	EFF	10
1893	DICHLOROMETHANE	51		INF	06/24/80	.	ND	EFF	10
1894	DICHLOROMETHANE	27		INF	06/25/80	14		EFF	10
1895	DICHLOROMETHANE	49		INF	06/26/80	.	ND	EFF	10
1896	DICHLOROMETHANE	.	ND	INF	06/30/80	.	ND	EFF	10
1897	DICHLOROMETHANE	220		INF	07/01/80	12		EFF	10
1898	DICHLOROMETHANE	.	ND	INF	07/02/80	.	ND	EFF	10
1899	DICHLOROMETHANE	.	ND	INF	07/03/80	10		EFF	10
1900	DICHLOROMETHANE	.	ND	INF	07/07/80	.	ND	EFF	10
1901	DICHLOROMETHANE	117		INF	07/08/80	14		EFF	10
1902	DICHLOROMETHANE	28		INF	07/09/80	.	ND	EFF	10
1903	DICHLOROMETHANE	.	ND	INF	07/10/80	.	ND	EFF	10

---------- POLLUTANT NUMBER =44 PLANT =2693P ----------

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
								EE11A	10
1904	DICHLOROMETHANE	.			03/07/83	17		EE11A	10
1905	DICHLOROMETHANE	.			03/13/83	25		EE11A	10
1906	DICHLOROMETHANE	.			03/21/83	26		EE11A	10
1907	DICHLOROMETHANE	.			03/27/83	30			

1090V AND =1090V ARE TWO DIFFERENT TREATMENT SYSTEMS FROM THE SAME PLANT

115422

LISTING OF EDITED DAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

POLLUTANT NUMBER =70 PLANT =948F

DOS	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
2720	DIETHYL PHTHALATE	675		INF	06/18/80	15		EFF	10
2721	DIETHYL PHTHALATE	750		INF	06/19/80	19		EFF	10
2722	DIETHYL PHTHALATE	568		INF	06/20/80	.	ND	EFF	10
2723	DIETHYL PHTHALATE	550		INF	06/23/80	100		EFF	10
2724	DIETHYL PHTHALATE	2013		INF	06/24/80	.	ND	EFF	10
2725	DIETHYL PHTHALATE	1560		INF	06/25/80	14		EFF	10
2726	DIETHYL PHTHALATE	15000		INF	06/26/80	25		EFF	10
2727	DIETHYL PHTHALATE	3795		INF	06/27/80	99		EFF	10
2728	DIETHYL PHTHALATE	165		INF	07/07/80	16		EFF	10
2729	DIETHYL PHTHALATE	202		INF	07/08/80	10		EFF	10
2730	DIETHYL PHTHALATE	175		INF	07/09/80	.	ND	EFF	10
2731	DIETHYL PHTHALATE	246		INF	07/10/80	12		EFF	10
2732	DIETHYL PHTHALATE	217		INF	07/11/80	.	ND	EFF	10
2733	DIETHYL PHTHALATE	111		INF	07/14/80	21		EFF	10
2734	DIETHYL PHTHALATE	302		INF	07/15/80	16		EFF	10
2735	DIETHYL PHTHALATE	40		INF	07/16/80	10		EFF	10
2736	DIETHYL PHTHALATE	49		INF	07/17/80	.	ND	EFF	10
2737	DIETHYL PHTHALATE	44		INF	07/18/80	.	ND	EFF	10
2738	DIETHYL PHTHALATE	14		INF	07/21/80	.	ND	EFF	10
2739	DIETHYL PHTHALATE	156		INF	07/22/80	.	ND	EFF	10
2740	DIETHYL PHTHALATE	169		INF	07/23/80	.	ND	EFF	10
2741	DIETHYL PHTHALATE	249		INF	07/24/80	11		EFF	10
2742	DIETHYL PHTHALATE	665		INF	07/25/80	18		EFF	10
2743	DIETHYL PHTHALATE	1090		INF	07/28/80	13		EFF	10
2744	DIETHYL PHTHALATE	1628		INF	07/29/80	19		EFF	10
2745	DIETHYL PHTHALATE	1490		INF	07/30/80	175		EFF	10
2746	DIETHYL PHTHALATE	2005		INF	07/31/80	17		EFF	10
2747	DIETHYL PHTHALATE	1055		INF	08/01/80	12		EFF	10
2748	DIETHYL PHTHALATE	2060		INF	08/04/80	15		EFF	10
2749	DIETHYL PHTHALATE	955		INF	08/05/80	11		EFF	10
2750	DIETHYL PHTHALATE	1418		INF	08/06/80	12		EFF	10
2751	DIETHYL PHTHALATE	1547		INF	08/07/80	13		EFF	10
2752	DIETHYL PHTHALATE	383		INF	08/08/80	10		EFF	10

1890V AND =1890V ARE TWO DIFFERENT TREATMENT SYSTEMS FROM THE SAME PLANT

115456

LISTING OF EDITED BAT OPTION II TOXICS
(SUBCATEGORY ONE) LIMITATIONS DATA BASE
PLANTS WITH T SUFFIX DENOTE PLANTS FROM 12-PLANT STUDY
PLANTS WITH F SUFFIX DENOTE PLANTS FROM 5-PLANT STUDY
PLANTS WITH V SUFFIX DENOTE PLANTS FROM VERIFICATION STUDY
PLANTS WITH P SUFFIX DENOTE PLANTS FROM PUBLIC COMMENTS
AND SUPPLEMENTAL QUESTIONNAIRE
SORTED BY POLLUTANT NUMBER

POLLUTANT NUMBER =70 PLANT =948V

003	POLLUTANT NAME	INFLUENT CONCENTRATION (PPB)	INFLUENT BELOW MINIMUM LEVEL (ND)	INFLUENT SAMPLING SITE	SAMPLING DATE	EFFLUENT CONCENTRATION (PPB)	EFFLUENT BELOW MINIMUM LEVEL (ND)	EFFLUENT SAMPLING SITE	MINIMUM LEVEL (PPB)
2753	DIETHYL PHTHALATE	.	ND	INF	05/15/79	48		EFF	10
2754	DIETHYL PHTHALATE	.	ND	INF	05/16/79	65		EFF	10
2755	DIETHYL PHTHALATE	176		INF	05/17/79	69		EFF	10
2756	DIETHYL PHTHALATE	440		INF	05/22/79	48		EFF	10
2757	DIETHYL PHTHALATE	660		INF	05/23/79	65		EFF	10
2758	DIETHYL PHTHALATE	1285		INF	05/24/79	73		EFF	10

#1890V AND #1890V ARE TWO DIFFERENT TREATMENT SYSTEMS FROM THE SAME PLANT

115457